DOCUMENT RESUME

ED 275 964 CG 019 496

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TITLE Sources of Sex Education as a Function of Sex, Coital Activity, and Type of Information.
PUB DATE Apr 86
NOTE 54p.; Paper presented at the Annual Meeting of the American Educational Research Association (67th, San Francisco, CA, April 16-20, 1986).
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *College Students; Health Education; Higher Education; Human Body; *Information Sources; *Knowledge Level; Parent Influence; Peer Influence; Reading Materials; *Sex Differences; *Sex Education; *Sexuality; Student Behavior

ABSTRACT

The perceived importance of sources of sex education and the effects of gender, coital activity, and type of information were studied, and previous studies were assessed. Attention was directed to the relative contribution of parents, institutions, reading, and peers to the information about each of 35 different sexual topics of 116 male and 116 female, coitally experienced (CE) or inexperienced (CIE), midwestern college students who had never been married. The students, who were primarily freshman and sophomores, completed the Sex Education Questionnaire and the Knowledge of Sexuality Test, among other measures. Individual reading and peers were the highest rated sources of information. Institutions were highly rated sources for topics related to the anatomy and physiology of sex and venereal disease. While CE students received more information overall than did CIE individuals, the two groups did not differ in the amount of information received from parents. CE students received more information through reading and from peers than did CIE students. Amount of information received from parents correlated negatively with performance on a sexual knowledge test. Tables include a summary of 24 studies of adolescent sources of sex information, including the age of subjects, topics included, and main findings. A 37-item bibliography is provided. (Author/SW)

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Sources of Sex Education as a Function of Sex, Coital Activity, and Type of Information

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Abstract

Previous studies of the sources of sex education are reviewed and critically analyzed. Most previous studies either have examined the limited issue of which source of sex education is most important; examined the sources of only a few sexual topics, or have used inadequate methodology. In the present study, more adequate data regarding the relative contribution parents, institutions, reading, and peers to information about each of 35 different sexual topics were obtained from a sample of 232 male or female, coitally experienced or inexperienced, midwestern college students. Individual reading and peers were the highest rated sources overall and on most of the subcategories of items. Institutions were highly rated sources for topics related to the anatomy and physiology of sex and venereal disease. Coitally experienced (CE) individuals reported receiving more information overall than coitally inexperienced (CIE) individuals. However contrary to previous specualtions, CE and CIE individuals did not differ in the amount of information received from parents. Instead, CE individuals received more information through reading and from peers than did CIE individuals. Consistent with previous findings, amount of information received from parents correlated negatively with performance on a sexual knowledge test. Comparison of the present results with previous research suggested a developmental hypothesis, namely that as individuals develop from early adolescence to young adulthood and become more sexually active, individual reading becomes a more important source of sexual information.

Sources of Sex Education as a Function of Sex, Coital Activity, and Type of Information

In general, sex educators and adolescent psychologists have believed that adolescents received the majority of their sex education from peers (Conger and Peterson, 1984; Garbarino, 1980; Rice; 1984; Rogers, 1985; Santrock, 1984; Thornburg 1982). Because this source is believed to be generally inaccurate, this belief has been used to support the need for increased sex education in schools. Unfortunately for this belief, our scientific understanding of the sources of sexual learning is quite limited. Only a relatively small number of studies have examined the issue of sources of sex education and the methodologies used in the studies have been less than sterling.

Several studies have reported that peers are the primary source of most sex education (Angelino & Mech, 1955; Bell, 1938; Davis & Harris, 1982; Dickinson, 1978; Elias & Gebhard, 1969; Landis & Landis, 1952; 1977; Libby, Acock, & Payne, 1974; Ramsey, 1943; Shirreffs & Dezelsky, 1979; Spanier, 1977; Thornburg, 1970, 1972, 1981a & b; and Witmar, 1929). Dickinson (1978) reported that reliance on peers seems to have increased in the period 1964-1974.

Other researchers have reported conflicting findings. Juhasz (1969), Landis and Landis (1948), and Andre, Frevert, and Schuchmann (1986) reported that, overall, reading was the major source of sex information. In the Landis and Landis study, reading was the predominant source for men; for women, mothers and reading seemed to be about equally important being chosen by 28% and 27% respectively. Other studies have indicated that parents are the main source of sex education (Goldman & Goldman, 1981) or that or that school was the most frequently chosen source (Lee, 1952).

In part, the issue of the most importance source of sex education is a political question. If peers are viewed as the prime, but inaccurate, source of sex education, then proponents of societally supported school-based sex education can argue that inaccurate information is being learned and that formal sex education is needed. From a scientific perspective, a more interesting issue than What is the source of sex education? is the question How does knowledge about sexuality develop? An examination of the nature and type of information provided by different sources is relevant to this latter question. Sexuality is a complex topic and sex education does not occur in one instant or moment of insight. An individual will learn about sexual topics from several sources and from different sources for different topics. Different sexual topics will be more relevant at some times and not others. Researchers seeking the sources of sexual knowledge have not taken this complexity into account. Even a cursory examination of the literature on sources of sex education suggests that no single source of sex education can be named. Table 1 summarizes the results of the majority of the available studies. In few of the studies is any given source selected by a majority of respondents. Rather several sources typically receive pluralities. Such a pattern suggests that sex education has many, not a predominant, source. In addition, analysis of the results of Table 1 supports the generalization that sources of sex education vary for different topics. Parents are reported to provide initial information about the origin of babies, and for females especially, provide information about menstruation and intercourse. Parents typically provide less information about more sensitive topics (Thornburg, 1982).

Table 1 also summarizes the methodology used in the students. Analysis of this methodology suggest that the research on the topic of source of sex

education has been plagued both by methodological inconsistency across studies and by undefined terminology. In many of the studies, respondents selected a single major source of sex education or ranked or rated sources of overall sex education or information. The problem with this procedure is that sex education or sex information are ambiguous terms which can refer to learning about "where babies come from", the nature of intercourse, reproductive anatomy and physiology (menstruation, nocturnal emissions, etc), sexual techniques and activities (ala Joy of Sex), or sexual values and attitudes. Many of the researchers have asked respondents to name a single source of "sex education" or "most sex education" or "first sex education." What respondents rate probably varied considerably depending upon their interpretation of the term and their own knowledge of sexuality. It also seems likely that respondents of different ages may be rating different kinds of knowledge. This inconsistency in what respondents are rating inhibits generalization across different studies.

A related problem is that some researchers have asked respondents to name the most important source of overall sex education while others have asked respondents to name the source of first sex education. For example, Thornburg (1970, 1972, 1975, 1978, 1981) has conducted a major series of studies looking at the first source of sex education, but has interpreted first source as most important source. In a review of his studies, he concluded that "peers emerged as the primary source of sex education" (Thornburg, 1982). The methodology of examining first source has been used by many authors. Clearly, there is a conceptual difference between most important and initial sources of sex education. Generalizing from first source to most important source of sex education is not warranted. Gynecologists probably first learn about the process of impregnation from

their parents, one would hope that this is not their most important source of expertise. Although this may be an extreme example, most adults would probably agree that they had first learned about some aspect of sexuality from one source and later learned more important information from a different source.

Related methodological problems are that some researchers have asked respondents to select a single source of sex education or to rank a given series of sources. Both procedures may mask differences and similarities from between sources. When only single source is named, information about the relative importance of other sources is lost. Ranking procedures lose information about the difference among sources. Suppose peers and reading are predominant sources for most respondents and that respondents perceive them about equally with a slight edge to reading. Asking respondents to rank these sources will lead to a rank of 1 for reading and a rank of 2 for peers, but the similarity in perceived importance will be lost. This difficulty with ranking procedures has long been appreciated (eg. Partin, 1950). One solution to these methodological problems is to ask respondents to rate the perceived importance of each of several sources of sex education. Such a solution permits assessment of the relative importance of sex education sources. This procedure was used in the present study.

As noted above, sexuality is a complex topic. Sex education can involve learning much different information, attitudes, and values. The perceived importance of sex education sources is likely to vary as a function of topic. Many researchers have asked about only about sex education in general. Others have examine only a few topics. Thornburg (1970, 1972, 1975, 1981a, b, 1982) has explored the most extensive variety of topics, including 12 different topics in his studies of initial sources

of sex education. Differences among topics were found in his studies; girls reported that mothers were an important first source for topics such as menstruation and conception, but were not important sources for other sexual topics. Probably because of the emotional sensitivity of the topic of sexuality, the sources of specific topics such as oral sex and foreplay techniques have not been explored. In the present study, in order to get a broader picture of sexual sources for a variety of topics, respondents rated 35 different sexual topics.

Finally, it seems likely that individual difference variables such as age, involvement in sexual activity, gender, social class, or ethnic background, may influence the respondents' perceived importance of sources of sex education. Davis and Harris (1982) reported that gender and ethnic/cultural background influenced perceived importance of sources. It seems reasonable to the present authors that involvement in sexual activity may change a respondents needs for sex related information and lead to a search for additional information. For example, a person who becomes coitally active may desire additional information on sexual techniques and read sex manuals or ask friends. The perceived importance of sources of sexual information may change as a result. In the present study, respondents were classified by gender and involvement in sexual activity and differences between their ratings of different sources were explored.

The major purpose of the present study was to extend knowledge about the perceived importance of sources of sex education for a greater variety of sexual topics than have been explored in previous research and to see if perceived importance varied as a function of gender and coital activity. On the basis of previous research, it was expected that males and females would perceive different sources as more or less important for different topics.

For example, females were expected to perceive that parents were a more important source for topics related to menstruation and anatomy than would males. It was also expected that coital experience would influence the perceived importance of sources.

Method

Subjects. The subjects consisted of 116 male and 116 female never married college undergraduates at a large midwestern state university who participated for extra course credit. The students were primarily freshman and sophomores who were taking introductory psychology classes. Subjects signed up to participate in the study on an announcement sheet posted on the bulletin board normally used for such purposes in the main authors department. The facts that the study involved questions about sexual behaviors, attitudes, and knowledge and that the questionnaires would be completely anonymously were stated on the announcement sheet. Subjects were told they could stop participating in the study at any time without penalty; no subject who came to an experimental session choose to stop participating. However, some subjects omitted some items; because of this, the degrees of freedom in the analyses reported below will vary from slightly from these totals.

Questionnaires. The respondents were participating in a larger study of college student sexuality of which the present data represent only a part. The students completed several questionnaires dealing with sexuality which were completed in one session lasting about 2 hours. The questionnaires included in The present study were: The Sex Education Questionnaire, The Knowledge of Sexuality Test, and a questionnaire dealing with current sexual behavior. The only item from the latter used in the present study was an item that asked if the respondent had ever engaged in coitus.

The Sex Education Questionnaire. This instrument contained 5 parts. Part 1 asked respondents to rate the percentage of their total sex education they had received from 14 potential sources: mother, father, sister, brother, grandparents, friends, doctor, church, school, reading, Planned Parenthood or similar organization, prostitute, experience, spouse or lover. The sources were rated on a 5-point scale defined as follows: 1= 0 -20%, 2 = 21-40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%.

Parts 2-5 asked respondents to rate how much information they had received from a given source about each of 35 different topics. The topics are listed in Table 1. Parts 2 - 5 dealt respectively with the sources: Parents, Institutions (School or Church), Individual Reading, and Peers. For each source and topic, the respondent rated how much information that source provided on that topic on a five point scale containing the following points: 1=no information was provided on this topic, 2=minimal information was provided on this topic, 3=fair amount of information was provided on this topic, 4=considerable information was provided on this topic, 5=complete and thorough information was provided on this topic. The questionnaire was typed on 8.5 by 11 in (21.59 X 27.94 cm) paper and reproduced by ditto technology. Standard rating instructions were given to the respondents.

The Knowledge of Sexuality Test. The knowledge of sexuality test consisted of a 6-part experimenter constructed multiple choice test. Part 1 consisted of a 24-item test of anatomy. Respondents were presented with diagrams of the male and female reproductive systems and asked to select the correct label for the indicated components from among 4 alternatives. Part 2 consisted on a 15-item four alternative multiple choice items dealing with venereal disease. Part 3 consisted of a 15-item four alternative multiple

choice test about birth control. Part 4 contained 15 four alternative multiple choice items dealing with reproductive physiology. Part 5 consisted of 30 true-false items taken from a college level human sexuality text. The items were selected to represent each of the chapters in the text. Examples of the items are:

> Typical females have a YY chromosome pair.

> The sex flush occurs in about 75% of women at orgasm.

> Gonorrhea may be contracted through oral sex.

Part 6 of the test contained 26 true-false items from the Mosher sex myths scale.

Procedure The students participated in large groups in a typical college auditorium. When respondents enterred the room they received a packet of questionnaires. They were instructed to complete the questionnaires in order and to mark their responses on the machine scoreable answer sheet provided. No discussion was permitted among participants. When the questionnaires were completed, the respondents returned them to the experimenter, filled out an extra credit card, and left. Completion of the questionnaires took approximately two hours.

Results and Discussion

The demographic data collected on the subjects indicated that they were predominantly freshman (52%) and sophomores (20%), identified with a protestant (44%) or catholic (38%) religious background, and from smaller communities (64% from communities of 40,000 or less) in Iowa (67%). Of the males, 69% and of the females, 70%, had reported having experienced coitus at least once. These demographic characteristics are consistent with other studies done on this population (Frevert, Andre, Bender, 1980, 1981; Andre, Frevert, & Hecht (1981). While a majority were coitally experienced, other

research done on this population suggests that the frequency of coital activity is considerably lower; Andre and Moses (1985) in a study conducted on the same population reported that only about 1/3 had been coitally active in the month previous to the data collection.

The various data from the Sources of Sex Education Questionnaire were analyzed using 2 (Sex, male vs female) X 2 (Coital experience, experienced vs inexperienced) X 4 (Source, parent, institutions, reading, or peers) mixed (between/within) analyses of variance (ANOVAs). Source of sex education was the within subject factor. Because of unequal n in the cells, the general linear model procedure in the Statistical Analysis System (SAS) computer package was used to provide least squares estimates of ANOVA solutions. The results for each of the dependent measures are discussed separately below.

Overall Ratings of Each Source An overall mean rating across topics for each source was computed for each respondent. The ANOVA revealed significant main effects of Sex [$F(1,201)=5.20$, $p < .024$, MS-error=1.239, M-males=2.44, M-females=2.55]; females perceived receiving a higher level of sex education overall than did males. The factor of Coital Experience was also significant, [$F(1,201)=10.31$, $p<.0015$, MS-error=1.239; M-experienced=2.57, M-inexperience=2.31]; coitally experienced individuals reported a higher level of sex education than did coitally inexperienced individuals. A significant effect of Source of Sex Education was also observed, [$F(3,603)=61.32$, $p<.001$, MS-error=0.492, M-parents=1.95, M-institutions=2.50, M-reading=2.91, M-peers=2.68]; overall, reading was the highest rated source, followed by peers, school and parents. Table 3 presents the individual cell means.

Insert Table 3 about here

The Source X Coital Experience interaction also proved significant [$F(3,603)=6.65$, $p<.0003$, MS-error=0.49]. Basically, coitally experienced and inexperienced individuals did not differ in their ratings of institutions and parents, but coitally experienced individuals rated reading and peers much higher than did coitally inexperienced individuals. This interaction is shown in Figure 1.

Insert Figure 1 about here

Analyses of Subscales As noted above, the Sources of Sex Education Questionnaire contained 6 subscales dealing with different aspects of sexuality. In order to provide a more detailed picture of how ratings changed across topics, separate 2 X 2 X 4 ANOVAs were conducted on each of the subscales. Table 3 presents the individual cell means on each of these variables.

Insert Table 3 about here

Reproductive Anatomy and Physiology The main effects of Sex and Coital Experience proved significant [$F(1,201)=9.77$, $p<.002$, & $F(1,201)=7.15$, $p<008$, respectively, MS-error=1.489). Females (M=2.74) rated their education for this topic higher than did males (M=2.56). Coitally Experienced individuals (M=2.71) rated their sources higher than did Coitally inexperienced individuals (M=2.51). The main effect of Source was also significant [$F(3,603)=53.83$, $p<.0001$, MS-error=0.696]. Reading (M=3.07) was the highest rated source followed by Institutions (M=2.80), Peers (M=2.74), and Parents (M=2.03). There was a significant Source by

Coital Experience interaction [$F(7.25)$, $p<.0001$], shown in Figure 2. Basically the differences in ratings between coitally experienced and inexperienced individuals were trivial (about .1 scale points) except for the Peers source. On the latter, coitally experienced individuals averaged about 3.0 whereas coitally inexperienced individual averaged about 2.2. This latter difference is about 90% of a standard deviation. The individual cell means are given in Table 4.

Insert Table 4 about here

Venereal Disease The main effect of Coital Experience proved significant [$F(1,201)=11.45$, $p<.0009$), MS-error=1.723. Coitally experienced individuals (M=2.89) produced higher ratings than Coitally inexperienced individuals (M=2.58). The main effect of Source was also significant [$F(3,603)=64.84$, $p<.0001$, MS-error = 1.087]. Institutions (M=3.28) were the highest rated source followed by Reading (M=3.17), Peers (M=2.62), and Parents (M=2.06). The interaction of Sex by Source proved significant [$F(3,603)=6.93$, $p<.0001$]. Females rated institutions and reading higher than did males, but males rated peers higher than did females. The individual cell means are reported in Table 5.

Insert Table 5 about here

Birth Control There were significant main effects of Sex and Coital Experience [$F(1,201)=7.03$, $p<.009$ & $F(1,201)=16.46$, $p<.0001$, respectively, MS-error=1.690]. Females (M=2.73) rated their sources higher than did males (M=2.58) and coitally experienced individuals (M=2.77) rated their sources higher than did coitally inexperienced individuals (M=2.39). There was a significant main effect of Source [$F(3,603)=57.17$, $p<.0001$, MS-error =

0.858]. Reading (M=3.11) was the highest rated source followed by Institutions (M=2.83), Peers (M=2.78), and Parents (1.90). A significant Source X Coital Experience interaction [F(3,603)=5.68, p<.0009] modified interpretation of the source effect. The interaction is shown in Figure 3. There were essentially no differences between coitally experienced and inexperienced respondents in ratings of parents and institutions, but coitally experienced individuals rated reading and peers much higher than did coitally inexperienced individuals. In fact, for coitally inexperienced individuals, institutions are the highest rated source, but for coitally experienced individuals, reading and peers are both more highly rated than institutions. The individual cell means are reported in Table 6.

Insert Table 6 and Figure 3 about here

Sexual Behaviors and Techniques There were significant main effects of Coital Experience and of Source [F(1,199)= 13.18, p<.0004, MS-error=1.179 & F(3,597)=117.91, p<.0001, MS-error=0.576, respectively]. Again, Coitally experienced individuals (M=2.45) rated the information they had received overall in the area of sexual behaviors and techniques higher than did coitally inexperienced individuals (M=2.14). Peers (M=2.92) and reading (M=2.88) were the highest rated sources overall followed by schools (M=2.06) and parents (M=1.68). The Source by Coital Experience interaction was significant. This interaction is shown in Figure 4 and the pattern is similar to the Birth Control interaction above. Coitally experienced and inexperienced individuals did not differ much in their ratings of institutions and parents, but coitally experienced individuals rated peers and reading about a standard deviation higher than did coitally inexperienced individuals. The individual cell means are reported in Table

7.

Insert Table 7 and Figure 4 about here

Values and Interpersonal Relationships The main effect of Sex was significant [$F(1,199)=9.04$, $p<.003$, MS-error=1.653]. Similarly, the main effect of Source was significant [$F(3,597)=25.17$, $p<.0001$, MS-error=.516]. Female's ratings (M=2.60) were higher than male's (M=2.38). Reading (M=2.78) was the highest rated source followed by Peers (M=2.58), Institutions (M=2.48) and Parents (M=2.14). Again the Source by Coital Experience interaction was significant [$F(3,597)=4.57$, $p<.005$], see Figure 5, and the pattern was similar to the variables above. Coitally experienced and inexperienced individuals did not differ much on the parent, institution, or reading sources, but coitally experienced individual rated the peers source much higher than did coitally inexperienced individuals.

Insert Table 8 and Figure 5 about here

Sex Problems There were significant main effects of Coital Experience [$F(1,199)=7.53$, $p<.007$, MS-error=1.746] and Source [$F(3,597)=43.65$, $p<.0001$, MS-error=0.672]. Coitally experienced individuals (M=2.15) rated their sources higher than did coitally inexperienced individuals (M=1.85). Across the fours Sources, the order of means was: Reading (M=2.48), Peers (M=2.23), Institutions (M=1.93), and Parents (M=1.63). Again the Source by Coital Experience interaction was significant [$F(3,597)=5.24$, $p<.007$], see Figure 6, and the pattern was similar to those above. The coitally experienced and inexperienced individuals did not differ much in terms of education received from parents, institutions or through reading, but coitally experienced individuals rated the education received from peers much higher than did coitally inexperienced individuals. The individual

cell means are presented in Table 9.

Insert Table 9 and Figure 6 about here

These analyses yield some interesting effects. The overall mean for females is higher than the overall mean for males, and the subscale means are higher for females in 4 of the six categories. This pattern may indicate that our culture may place a greater emphasis on educating females about particular aspects of sexuality than it does males. Typically previous research has reported that females have received more information from parents about topics such as menstruation and reproduction (Angelino and Mech, 1955; Coles and Stokes, 1985; Ramsey, 1943; Thornburg, 1982). Traditionally females have been expected to serve as the sexual regulators in our culture whereas males have been expected to pursue sexuality more vigorourly. These factors may contribute to the greater degree of sex education females perceive receiving. Of course, the male/female difference could reflect a response bias, but this seems unlikely as females reported receiving slightly, but nonsignificantly, less information than did males in the areas of Sexual Problems and Sexual Behaviors. If the sex differences observed on the other four scales were due to a bias on the part of females to rate sources higher than males (or vice-versa, a bias on the part of males to rate sources lower), then females' ratings should be higher than males' rating on all of the subscales. A response bias should effect each of the categories in the same way.

The pattern across sources and the interactions of source with coital experience are also interesting. Reading is the highest rated source overall and on most of the subscales; peers are usually the second highest rated source. Exceptions occur in the areas of reproduction and anatomy for

which institutions are the second highest source and venereal disease for which institutions are the highest rated source. Typical school curricula in sex education have emphasized the biological facts of sex, and prevention of venereal disease historically has been given as a supporting reason for school based sex education (Kirsch, 1930). It is not surprising that schools are rated fairly high in these areas. Schools are rated low and peers higher in areas that are typically not part of school curricula such as sexual techniques and problems. The findings that the respondents' ratings vary meaningfully across the different topics lends confidence that the scale validly reflects the amount of sex education respondents have received from various sources.

The differences between coitally experienced and inexperienced individuals are interesting. Generally coitally experienced individuals report receiving more information from peers than do coitally inexperienced individuals. Older studies had indicated that individuals who received more sex education from parents and less from peers were less likely to engage in premarital coitus (Chesser, 1957; Landis and Landis, 1948). The older studies had interpreted this as a causal effect, assuming that if parents provided more sex education, the probability of premarital coitus would decrease (Landis and Landis, 1948). In the present study, coitally experienced and inexperienced individuals did not differ in the amount of education received from parents, but coitally experienced individuals did receive more information from peers. Our interpretion of the present data is that, if there is a causal relation, it works the other way. The amount of parent education received does not reduce premarital coitus, but individuals who become coitally active may seek more and differ kinds of information about sex. Teenagers and college students are unlikely to seek

information such as birth control methods, sexual techniques, or advice concerning sexual problems from parents or from school sources. Instead, peers and reading may serve these informational needs. Thus, rather than source of sex education driving coitus, involvement in coitus may lead to increased information seeking.

Ratings of 14 Sex Education Sources. The respondents had also been asked to rate the percentage of their total sex education they had received from each of 14 different sources. These data are presented in Table 10. No statistical analyses were performed across sources; but there were some differences with the results of the topic by topic analysis. When asked to rate the overall sources of their sex education, friends emerged as the highest source followed by reading, school, and experience. When asked to rate 35 sex topics separately, reading emerged as the highest source, followed closely by peers. We suspect that this difference is due to differences in the perception of the respondents in what they were rating. When rating overall sex education, subjects may have included attitudes, values, and behavioral experiential learning in their ratings. Clearly this is appropriate because these are as much a part of sex education as are the more informationally oriented topics in the list of 35. When rating the list of 35 topics, respondents may have focused on more informational learning. These differences in focus could account for the variations in the ranks of reading and peers across methods. This finding also supports the contention that some of the differences in results observed in the previous literature and summarized in Table 1 can be accounted for by variations the variations in the rating methodology employed in those studies.

Insert Table 10 about here

We should note that we don't find the differences in the rank order of peers and reading across the two methodologies very important. Both methods yield results that suggest that peers and individual reading serve as very important sources of sex education particularly for topics that are not likely to be discussed in school or with parents.

Correlations with Knowledge Test Correlations were computed between the mean sex education ratings for each source and the scores on the parts and the total sex knowledge test. Because of the large number of correlations computed we used an alpha level of .01. The pattern of correlations on the subscales of the knowledge test and on the total scale were the same, so only correlations with the total scale will be reported. Only two correlations between the sex education ratings and the total knowledge test scale were of significant and of interest. The rated amount of parent education correlated negatively with total knowledge test score, $r(232)=-0.156$, $p<.01$. Ratings for the reading source correlated positively with the total knowledge test score, $r(207) = .297$, $p<.01$. Similar correlations were reported by Frevert et al. (1980, 1981). Apparently when respondents receive a lot of information from parents, they are likely to receive some misinformation. Learning about sexual topics from reading is likely to lead to more correct information acquisition. Of course, the size of the correlations are small and the relationship quite weak.

Table 11 presents the means scores on each of the knowledge test subscales. The correlations with the sex education scale may be somewhat inhibited by a floor effect on the knowledge test. Overall performance on the knowledge test was low. On the Anatomy section, the mean was 53%, in

previous studies using this same test, the average was approximately 70% (Andre, et al. 1981, Frevert, et al. 1980, 1981). On the remaining multiple choice section, performance ranged from 33% to 43% and on the true-false sections performance was at the chance level. In the Frevert et al. studies (1980, 1981), which sampled from the same population as the present study, respondents were also asked to rate their own knowledge of sexual topics. They tended to rate their knowledge quite highly, but their self rating was not matched by high performance on the knowledge test. We suspect that, had we asked respondents to rate their self knowledge, the same would be true in the present study. College students apparently believe that they know more about sexuality than they actually do.

Overall, the results of the present study are similar to the results obtained by Andre, et al. (1986) in a similar study. In that study, subjects completed a Sources of Sex Education questionnaire containing 42 topics per source and also completed a sex knowledge test containing the anatomy and general (true-false) sections of the test described above. As in the present study, reading was the highest rated source overall. But peers were closely behind reading. Similarly to the present study, institutions received high ratings in the areas of reproductive anatomy and physiology and venereal disease. The major difference with the result of the present study was that the interactions involving coital experience were not observed. In part, this may be due to the fact that Andre et al. (1986) had a much smaller sample than the present study. The similarity in the results between the studies lends support to the conclusion that for midwestern college students from predominately rural states such as Iowa, the sources of sex education perceived of as most important are individual reading and peers.

Andre et al. (1986) had suggested that reliance on different sources of sex education may change developmentally. For early information and training about sex, such as the answer to the childhood question of where babies come from, parents may be the more important source. For young adolescents, who may be ignorant of the full range of educational resources related to sexuality, peers may be first source. As individuals age and become more sexually involved and aware of additional resources, sources such as individual reading may become more important. Although the present study does not yield data directly on this issue, the results of the studies reported in Table 1, are roughly consistent with this hypothesized developmental trend. Obviously, developmentally oriented research can be conducted to examine this issue. If this developmental trend were to be supported by such research, it might have implications for social policy with respect to sex education. One possibility is that different emphasis might be placed on different media targeted to individuals of different ages. The idea would to work with the developmental trend rather than to oppose it. If most families find sexual topics too sensitive to deal with effectively, then perhaps the use of trained high school students to serve as a peer resource for older elementary or junior high school students might be an effective way of providing developmentally appropriate and accurate information about sex. A peer counseling/educational program or center, staffed by high school students, might be an effective approach. For high school and college students, for whom reading becomes a more important source, distribution of accurate reading material may be an effective way of providing accurate information about topics of interest.

The present results have implications for school based sex education. Overall schools are not rated as an important source of sex education, but

are rated as important in the areas that school curricula traditionally emphasize. This finding suggests that students do perceive an impact of school-based sex education. One hypothesis that could be drawn from this finding is that, were schools to expand coverage of topics, their importance in the development of sexual knowledge in other topic areas might increase.

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Table 1

Results of Studies That have examined Adolescent Sources of Sex Information

Study	Age of Subjects	Question Asked	Number of Topics	Finding
Amonker (1980)	90% female age 16.7 years	main source	sex, bc, pregnancy sexuality combined	Peers 52%, media 31%, parents 12% (exact form of question asked unclear)
Andre, Frevert Schuchmann (1986)	college males & females	rated info provided by 4 different sources	42	overall reading was highest rated source for males and females, peers were a close second, some differences were found for subsets of the topics
Angelino & Mech (1955)	college females	initial source	6, contraception vd, prostitution, masturbation, coitus, menstrua.	include menstruation peers 26%, moms, 25%, read 24% exclude menstruation peers 29%, read 27%, moms 53%
Coles & Stokes (1985)	attempted national sample of teenagers, sample never clearly described	primary source	5, reproduction, birth control, masturbation, homosexuality, sex techniques	sexes not differentiated results varied per topic reproduction school 53%, parents 23%, peers 15%, read 9% other topics school 24%, parents 13%, peers 25%, read 29%
Chesser (1957)	female medical patients	?	?	reported in Lewis (1963) more parent education receive lower premarital coitus
Davis & Harris (1982)	103 males & 185 females aged 11-18 white, hispanic native american	overall sex information received from various rated on 3 point scale	1, overall sex information	order of mean ratings, highest to lowest friends, school, read, parents

Dickinson (1978)	male and female, black and white, high school students	major source	overall sex information	parents preferred source use of friends as source increased 1964-1974

	peers	read	parents
white males 1964	42%	26%	18%
white males 1974	57%	15%	15%
white femls 1964	33%	16%	39%
white femls 1974	40%	16%	31%
black males 1964	16%	31%	27%
black males 1974	39%	16%	14%
black femls 1964	2%	41%	31%
black femls 1974	25%	29%	25%

Elias and Gebhard (1970)	305 boys age 10.3 127 girls age 7.6 & all prepubescent	sources of sex knowledge	1, sex knowledge	working class boys, peers 75-88% boys, lower white collar, peers 70% boys, upper white collar, peers 8%, mom 48%, both parents, 24%
Goldman & Goldman (1981)	838 boys and girls aged 5,7,9,11,13 15 in Australia Sweden, North America, England	source of most information	1, overall sex information	North America, mom 32%, dad 2%, peers 8%, media 17%, teachers 19% Australia, mom 23%, dad 3%, peers 8%, media 27%, teachers 19% England, mom ---, dad 4%, peers 9%, media 20%, teachers 28% Sweden, mom 15%, dad 0%, peers 8%, media 21%, teachers 31%
Juhasz (1969)	365 male & 528 female college students	main sources of sex information	1, overall sex information	males: read 59%, peers 19%, parents 10% females: read 48%, peers 20%, parents 19%
Landis & Landis (1948)	2000 male & female college students	source of most sex information	1, most information	Males: books 31% peers 16%, mom 6% dad 7% school 10% Females: books 27%, peers, 15%, mom 28%, dad 0%, school 11%

Landis & Landis (1952)	1600 male & female college students	source of most sex information	1, most information	Males: books 19%, peers 43%, mom 11%, dad 9%, school 5% Females: books 18%, peers 25%, mom 38%, dad 2%, school 7%
Landis & Landis (1977)	3189 male & female college students	source of most sex information	1, most information	Males: peers source choose by largest proportion Females: proportion who choose peers and mothers is about the same.
Lee (1952)	624 male and female high school students	check up to 10 listed sources	1, information about birth & reproduction	Males: school 41%, peers 40%, read 36%, mom 25%, dad 23% Female: school 47%, peers 43%, read 40%, mom 71%, dad 5%
Lewis (1963)	college male & f	major source?	1, overall sex ed	no means or percents reported more children relied on parents for sex ed less
Libby, Acock, & Payne (1974)	Parents (adult) actual sources	most important sources	overall sex educ	fathers-peers 51%, mothers 16%, father 15% church 3%, school 2%, misc(includes media) 15% mothers-mothers 40%, peers 32%, church 3%, school 3%, misc (includes media) 19%
	desired sources		overall sex educ	home-school & home-church predominate
Ramsey (1943)	291 boys aged 10-20, 85% between 12 & 16	first source	9, origin babies ejac., seminal emission, contraceptive, menstrua., masturb., coitus, prostitution, vd	including origin of babies / menstruation, peers 69.7%, mom 6.5 excluding origin of babies / menstruation, peers 74%, mom 1.8%

Shirreffs & Dezelsky (1979)	417 boys and girls aged 14-15 (1972) & 194 b&g aged 14-15 (1978)	source of first sex information	1, sex information	1972 sample-peers 30%, mom 21%, dad 3%, school 12%, media 6% 1978 sample-peers 32%, mom 20%, dad 5%, school 6%, media 13%
Thornburg (1970)	88 college females	initial source	11, contraception ejacul. homosex. coitus, masturb. menstruat. noctur. emission, origin babies, petting, prostitution, vd	overall, peers 38%, mom 19%, read 17%, school 12%
Thornburg (1972)	381 college females	initial source	see Thornburg (1970) above	overall peers 37.9%, read 20.6, mom 19.3%, school 14.8%
Thornburg 1973 study reported in Thornburg (1981b)	958 college students	initial source	see Thornburg (1970) above	overall: peers 38%, read 21%, school 20%, mom 13%
Thornburg 1977 study reported in Thornburg (1981b)	261 college students	initial source	see Thornburg (1970) above	overall: peers 26%, read 20%, school 26%, mom 19%
Thornburg (1981a)	542 male & 610 female high school students	initial source	see Thornburg (1970) above	overall: peers 37%, read 22%, school 15%, mom 17%

Thornburg (1981b)	review of previous Thornburg studies	In each of the Thornburg studies mothers have provided information for females primarily about origin of babies, mensuration, & intercourse not other topics

Table 2

Items Within Each Subcategory on The Sources of Sex Education Scale

Reproductive Anatomy and Physiology
- reproductive physiology (1)
- menstruation (2)
- anatomy of male sex organs (9)
- anatomy of female sex organs (10)
- ejaculation (11)
- nocturnal emission (wet dream) (12)
- orgasm (female) (29)
- orgasm (male) (30)
- physiology of sexual arousal (31)

Venereal Disease
- venereal disease (3)

Birth Control
- abortion (4)
- birth control pills (5)
- condoms (6)
- diaphragms (7)
- other birth control methods (8)

Sexual Behaviors and Techniques
- masturbation (13)
- vibrators (14)
- intercourse (general description) (17)
- intercourse techniques (18)
- petting (19)
- oral sex (20)
- sexual fantasy (35)

Values and Interpersonal Relationships
- male homosexuality (15)
- female homosexuality (16)
- sexual morality (21)
- interpersonal relationships in sexuality (22)
- premarital intercourse (23)
- sexuality in marriage (26)
- extramarital sex (27)
- bisexuality (28)
- interpersonal relationships in marriage (32)
- divorce (33)

Sexual Problems
- frigidity (24)
- impotence (25)
- premature ejaculation (34)

The number in parenthesis represents the ordinal position of the item on the original scale.

Table 3

Individual Cells Means on the Mean Rating Across All Items For Each Source

Group	Source of Sex Education			
	Parents	Institutions	Reading	Peers
Male-coitally experienced	1.61	2.17	2.71	2.17
Male-coitally inexperienced	1.98	2.54	2.92	2.83
Female-coitally experienced	2.08	2.80	2.70	2.34
Female-coitally inexperienced	2.02	2.47	3.09	2.94

Table 4

Individual Cells Means on Reproductive Anatomy and Physiology

Group	Source of Sex Education			
	Parents	Institutions	Reading	Peers
Male-coitally experienced	1.62	2.41	2.96	2.17
Male-coitally inexperienced	2.03	2.77	3.05	2.91
Female-coitally experienced	2.30	3.32	2.95	2.31
Female-coitally inexperienced	2.09	2.77	3.22	3.04

Table 5

Individual Cells Means on Venereal Disease

Group	Source of Sex Education			
	Parents	Institutions	Reading	Peers
Male-coitally experienced	1.62	2.74	2.97	2.50
Male-coitally inexperienced	2.21	3.26	3.14	2.87
Female-coitally experienced	2.03	3.76	2.84	2.19
Female-coitally inexperienced	2.13	3.35	3.45	2.61

Table 6

Individual Cells Means on Birth Control

Group	Source of Sex Education			
	Parents	Institutions	Reading	Peers
Male-coitally experienced	1.47	2.45	2.52	2.27
Male-coitally inexperienced	2.02	2.89	3.09	3.05
Female-coitally experienced	1.97	3.32	2.75	2.44
Female-coitally inexperienced	1.95	2.75	3.60	2.90

Table 7

Individual Cells Means on Sexual Behavior And Techniques

Group	Source of Sex Education			
	Parents	Institutions	Reading	Peers
Male-coitally experienced	1.51	1.91	2.80	2.36
Male-coitally inexperienced	1.80	2.14	2.98	3.09
Female-coitally experienced	1.62	2.01	2.56	2.48
Female-coitally inexperienced	1.67	2.08	2.96	3.22

Table 8

Individual Cells Means on Sexual Values And Relationships

Group	Source of Sex Education			
	Parents	Institutions	Reading	Peers
Male-coitally experienced	1.79	2.07	2.54	2.06
Male-coitally inexperienced	2.10	2.52	2.77	2.64
Female-coitally experienced	2.39	2.83	2.70	2.44
Female-coitally inexperienced	2.22	2.49	2.95	2.84

Table 9

Individual Cells Means on Sexual Problems

Group	Source of Sex Education			
	Parents	Institutions	Reading	Peers
Male-coitally experienced	1.40	1.77	2.52	1.77
Male-coitally inexperienced	1.70	2.04	1.48	1.72
Female-coitally experienced	1.48	1.98	2.17	1.73
Female-coitally inexperienced	1.72	1.86	2.45	2.50

Table 10

Mean Rating of Overall Sex Education Received From Each of 14 Different Sources

Source	Male		Female		Overall Mean
	coitally inexperienced	coitally experienced	coitally inexperienced	coitally experienced	
mother	1.71(35)	1.87(81)	2.68(35)	2.24(81)	2.10
father	1.71(34)	1.87(77)	1.60(33)	1.87(70)	1.80
sister	1.44(34)	1.40(77)	1.61(33)	1.75(69)	1.55
brother	1.44(34)	1.48(77)	1.27(33)	1.47(70)	1.44
grandparents	1.03(34)	1.19(78)	1.09(33)	1.26(70)	1.17
friends	3.05(34)	3.19(77)	3.45(33)	3.07(70)	3.17
doctor	1.29(34)	1.51(77)	1.39(33)	1.89(70)	1.60
church	1.44(34)	1.34(76)	1.24(33)	1.33(70)	1.34
school	2.50(34)	2.54(77)	3.00(33)	2.71(70)	2.66
reading	2.76(34)	2.81(76)	2.79(33)	2.90(70)	2.83
planned parent-hood etc	1.17(34)	1.24(77)	1.12(33)	1.70(71)	1.37
prostitute	1.08(34)	1.09(77)	1.09(33)	1.13(70)	1.10
experience	1.94(34)	2.60(77)	2.00(33)	2.80(69)	2.46
spouse or lover	1.62(34)	2.38(77)	1.76(33)	2.87(70)	2.32

Table 11

Mean Percent Correct On Each Section of the Knowledge Test

Section	Percent Correct
Anatomy	53.0
Venereal Disease	33.0
Birth Control	43.0
Physiology of Sex	34.0
General	54.0
Mosher	58.0

List of Figure Titles

Figure 1. Mean total ratings as a function of experience and source of sex education.

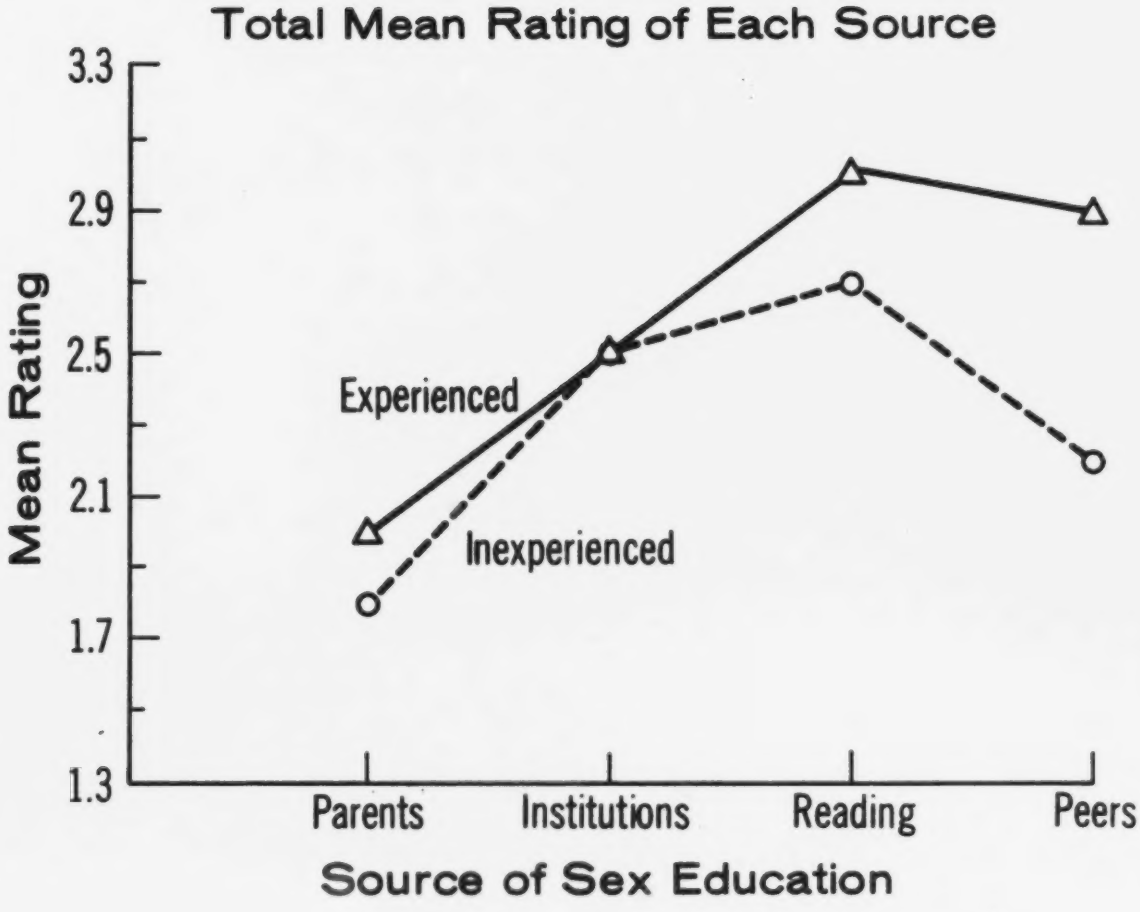
Figure 2. Mean ratings of anatomy and physiology items as a function of experience and source of sex education.

Figure 3. Mean ratings of birth control items as a function of experience and source of sex education.

Figure 4. Mean ratings of sexual behavior and technique items as a function of experience and source of sex education.

Figure 5. Mean ratings of sexual value and relationship items as a function of experience and source of sex education.

Figure 6. Mean ratings of sexual problem items as a function of experience and source of sex education.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2.1
1.7
1.3
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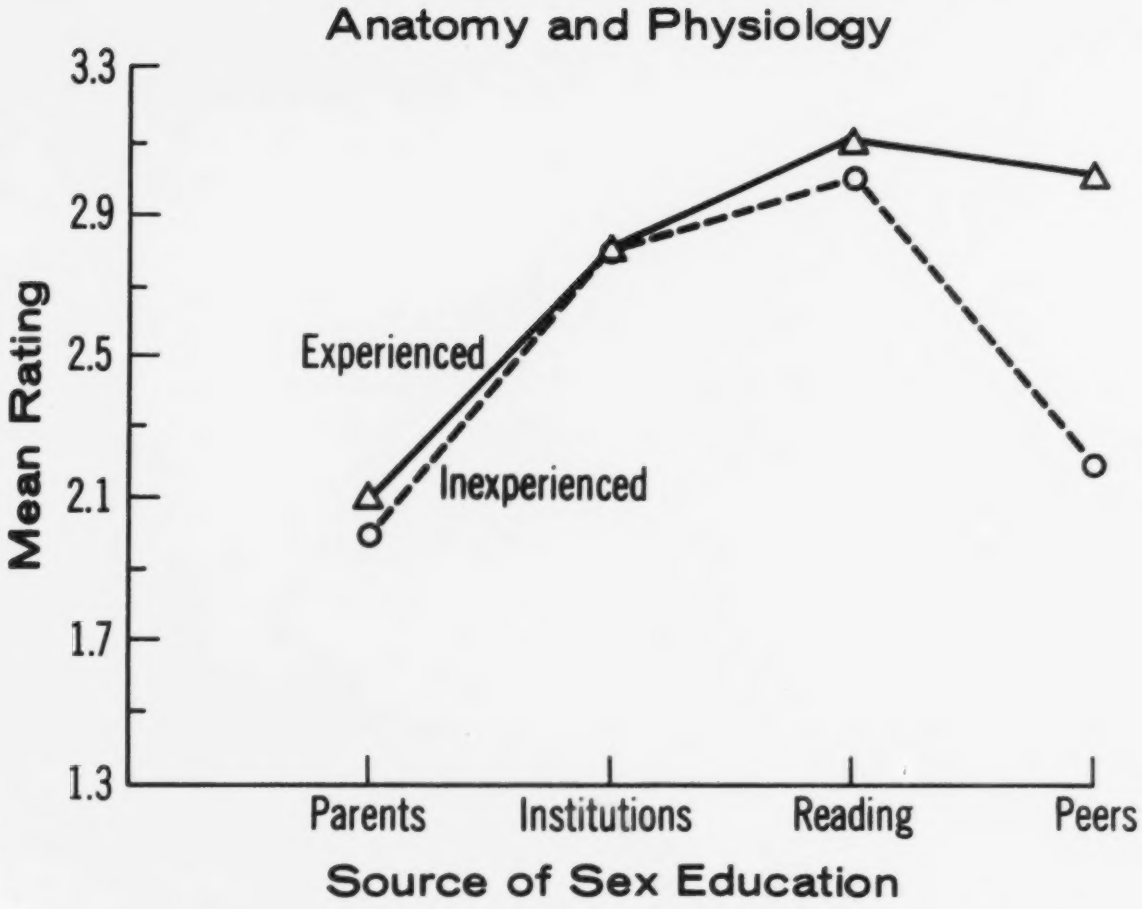
Inexperienced
Parents
Institutions
Reading
Peers
Source of Sex Education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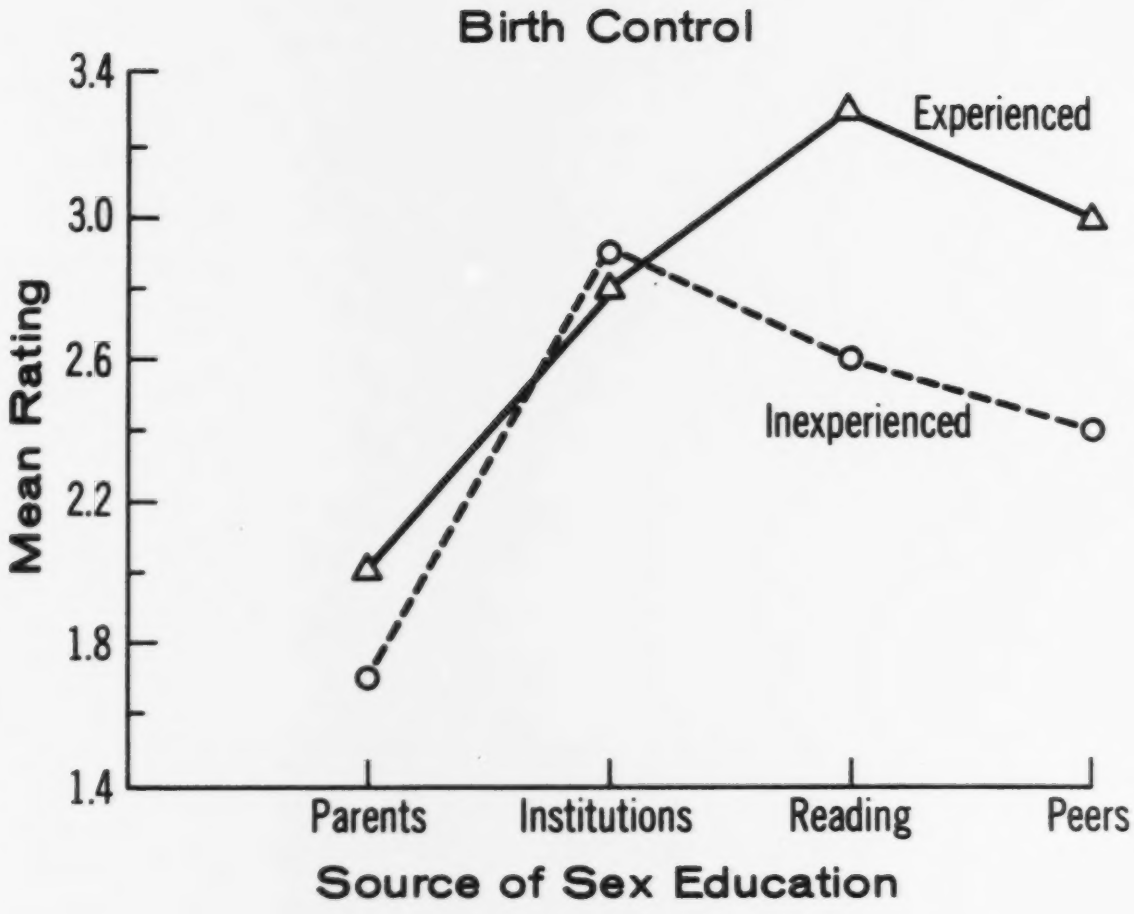
Source of Sex Education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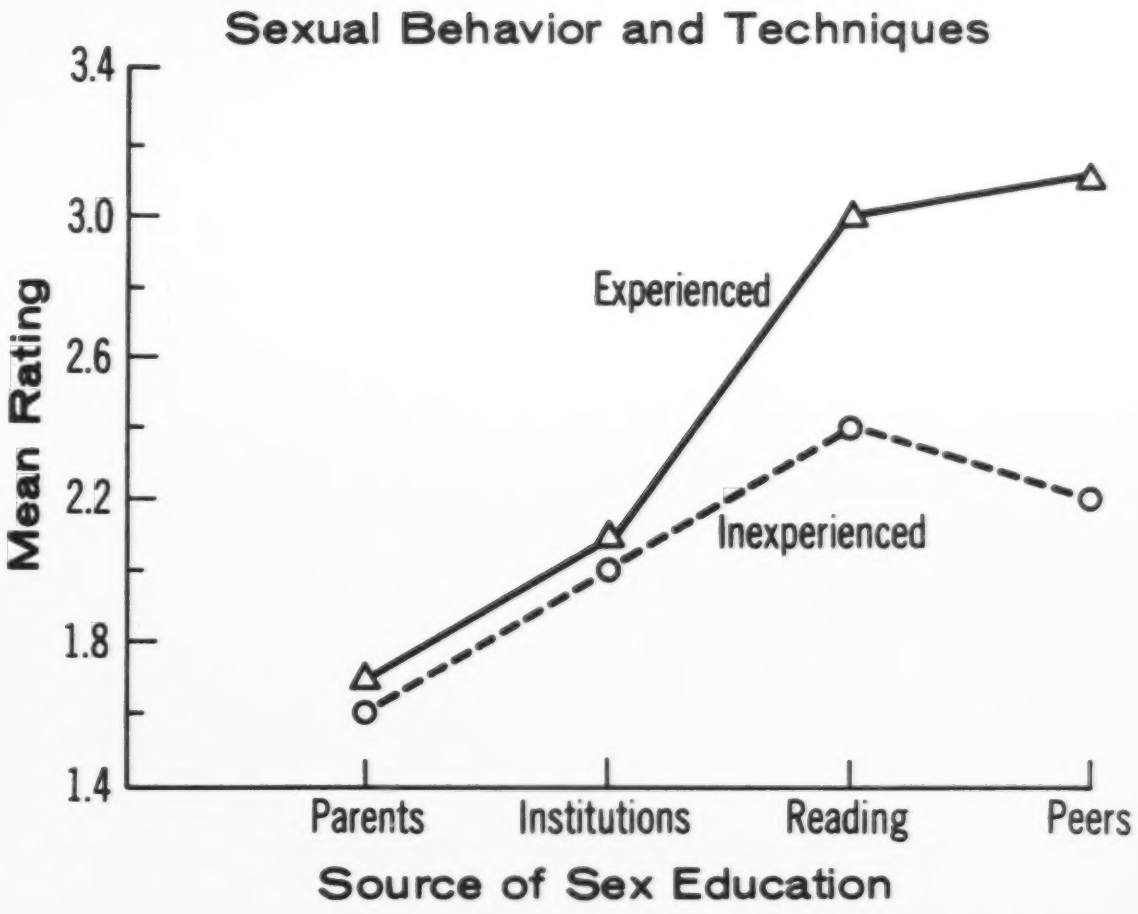
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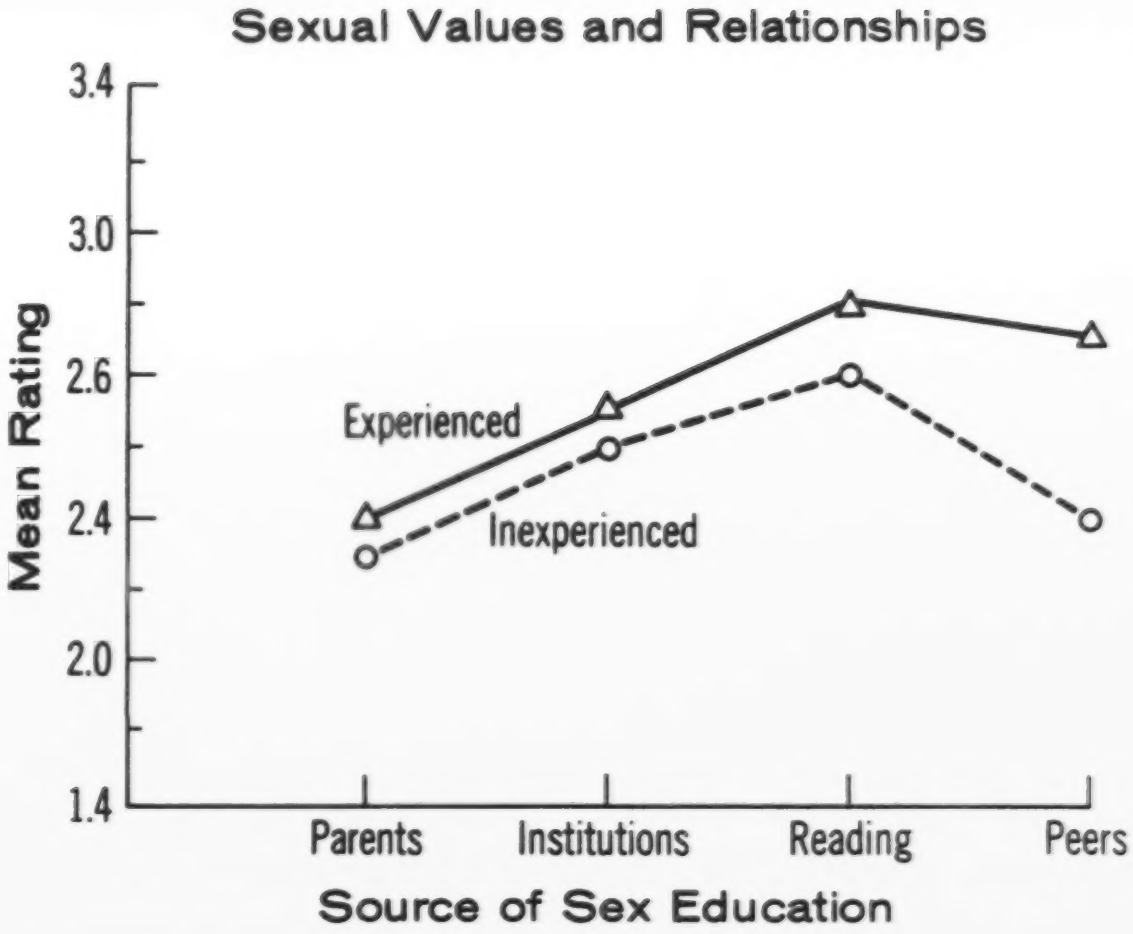
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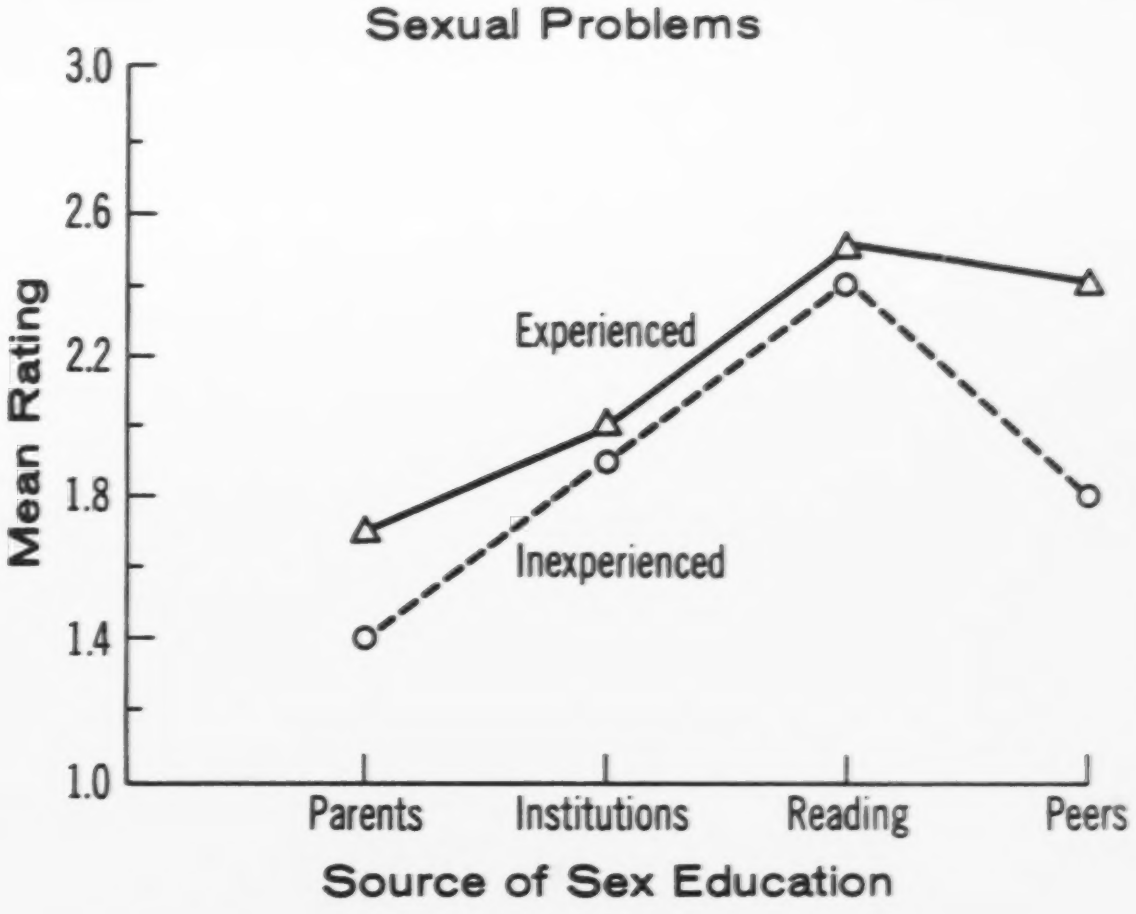
Peers
Source of Sex Education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Source of Sex Education